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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/720,024	11/21/2003	Matthew G. Thorn	CPCM:0047/FLE/FAR/STA 210	3206
47514	7590	03/31/2008	EXAMINER	
FLETCHER YODER (CHEVRON PHILLIPS)			LEE, RIP A	
P. O. BOX 692289			ART UNIT	PAPER NUMBER
HOUSTON, TX 77069			1796	
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			03/31/2008	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/720,024	THORN ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	RIP A. LEE	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 18 December 2007.

2a) This action is **FINAL**.                            2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 23,25-28 and 30 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5) Claim(s) \_\_\_\_\_ is/are allowed.

6) Claim(s) 23, 25-28 and 30 is/are rejected.

7) Claim(s) \_\_\_\_\_ is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All    b) Some \* c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.

4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.

5) Notice of Informal Patent Application

6) Other: \_\_\_\_\_.

## **DETAILED ACTION**

This office action follows a response filed on December 18, 2007. Claims 23, 25-28, and 30 are pending.

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 23 and 25-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The scope of the claims is unclear. The claims are drawn to a catalyst composition consisting essentially of metallocene and chemically treated solid oxide wherein the solid oxide may comprises unrecited elements. It is not clear what unrecited elements that fall under the term “comprises” would not materially affect the basic and novel characteristics of the claimed invention.

### ***Claim Rejections - 35 USC § 102 / 35 USC § 103***

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 25-28 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Marks *et al.* (U.S. 6,235,918).

Marks *et al.* discloses preparation of sulfated zirconia supported on silica (col. 3, lines 24-30) which qualifies as “silica-zirconia” solid oxide of the instant claims. Metallocenes used for preparation of catalyst include CpTiMe<sub>3</sub>, Cp<sup>\*</sup>TiMe<sub>3</sub> (Cp<sup>\*</sup> =  $\eta^5$ -pentamethylcyclopentadienyl) Cp<sub>2</sub>ZrMe<sub>2</sub>, Cp<sup>\*</sup>HfMe<sub>2</sub>, Cp<sup>\*</sup>ZrMe<sub>3</sub>, and CGCZrMe<sub>2</sub>. Preparation of catalysts containing these compounds contacted with sulfated silica-zirconia is immediately envisioned.

5. Claims 25, 26, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saudemont *et al.* (U.S. 6,239,059).

Saudemont *et al.* discloses a catalytic system comprising metallocene catalyst, a co-catalyst, and an activator solid support. The co-catalyst component is not required where the metallocene catalyst is pre-alkylated. Generally, metallocene catalyst is impregnated onto the support (col. 5, lines 27-29). Metallocenes satisfy the general formula  $ML_x$  (V), described in col. 5, lines 35-65. Exemplary metallocenes include  $Me_2Si(Ind)_2ZrMe_2$ ,  $Cp_2ZrMe_2$ ,  $Ind_2ZrMe_2$ ,  $Et(ThInd)_2ZrMe_2$ ,  $Et(Ind)_2ZrMe_2$ , and  $Cp_2ZrBz_2$ , where Bz is benzyl (col. 6, lines 60-67 and col. 7, line 5). Since the transition metal contains any group 4 metal, it would have been obvious to make catalysts with corresponding Ti and Hf analogues such as  $Cp_2HfMe_2$  and  $Et(Ind)_2HfMe_2$ . The support is silica or alumina (col. 2, line 25). Example 1 shows preparation of fluorided silica, and one having ordinary skill in the art would have found it obvious to prepare fluorided alumina from this teaching. The reference does not show catalyst systems in which co-catalyst is not required. One of ordinary skill in the catalyst art would have recognized that dimethyl complexes and dibenzyl complexes need not be pre-alkylated and that these compounds would be well-suited for preparation of catalyst systems which do not contain co-catalyst. Thus, it would have been obvious to one having ordinary skill in the art to prepare catalysts comprising  $Me_2Si(Ind)_2ZrMe_2$ ,  $Cp_2ZrMe_2$ ,  $Ind_2ZrMe_2$ ,  $Et(ThInd)_2ZrMe_2$ ,  $Et(Ind)_2ZrMe_2$ ,  $Cp_2ZrBz_2$ ,  $Cp_2HfMe_2$  and  $Et(Ind)_2HfMe_2$  with fluorided silica or fluorided alumina.

Co-catalysts include alkylaluminum and aluminoxanes (col. 7, lines 35-54). Catalysts contacted with these co-catalysts would remain obvious over the instant claims. Although catalysts consist essentially of metallocene and chemically treated solid oxide, the chemically treated solid oxide is comprises solid oxide treated with an electron-withdrawing anion. Those catalysts in which support is in intimate contact with alkylaluminum and aluminoxanes, such as those in one aspect of the invention of Saudemont *et al.*, are deemed to meet the claimed features because the term comprising would not exclude unrecited catalyst components. The subject of claim 30 is also obvious over the prior art even in those embodiments where aluminoxanes is used as co-catalyst because the catalyst would be substantially free of organoaluminum.

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6. Claims 26-28 and 30 are rejected under 35 U.S.C. 102(e) as being anticipated by McCullough *et al.* (U.S. 6,900,154).

McCullough *et al.* teaches catalysts containing metallocene and fluorided metal oxide support containing a halogenated aromatic aluminum compound covalently bound to the surface of said support (claim 1). Support materials include silica, alumina, zinc oxide, boria, aluminum phosphate, magnesia, and mixtures thereof (col. 4, lines 60-65). Representative metallocenes include  $\text{Cp}^*\text{TiBz}_3$ ,  $\text{Cp}^*\text{TiMe}_3$ ,  $(1,3\text{-BuMeCp})_2\text{ZrMe}_2$ ,  $\text{Me}_2\text{Si}(2\text{-MeInd})_2\text{ZrMe}_2$ , and  $\text{Cp}^*\text{ZrMe}_2$ , (col. 9, line 57-col. 10, line 15). Catalyst A contains  $(1,3\text{-BuMeCp})_2\text{ZrMe}_2$  and fluorided silica.

7. Claims 25-28 and 30 are also rejected under 35 U.S.C. 103(a) as being unpatentable over McCullough *et al.* (U.S. 6,900,154) in view of Naganuma *et al.* (EP 591 756).

McCullough *et al.* teaches that useful catalysts are prepared with compounds disclosed in Naganuma *et al.* EP-A-0 591 756 (col. 10, line 20). The foreign reference discloses standard metallocene and piano-stool complexes including  $\text{CpZrBz}_3$ ,  $\text{Cp}_2\text{ZrBz}_2$ ,  $\text{Cp}^*\text{ZrMe}_2$ ,  $\text{Et}(\text{Ind})_2\text{ZrMe}_2$  (pages 4 and 5). It would have been obvious to one having ordinary skill in the art to use the compounds disclosed in Naganuma *et al.* to make the supported catalysts because McCullough *et al.* instructs the skilled artisan to prepare such catalysts, and accordingly, the skilled artisan would have expected such a combination to result in the formation of a working, active catalyst. The combination is obvious because McCullough *et al.* discloses use of these compounds for preparing inventive catalysts, and Naganuma *et al.* furnishes the actual identity of these compounds.

8. Claims 26 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by McDaniel *et al.* (U.S. 6,355,594).

McDaniel *et al.* teaches a catalyst composition prepared by contacting organometal compound, fluorided silica-alumina, and organoaluminum compound (col. 11, lines 32-35). The organometal compound  $\text{Et}(\text{Ind})_2\text{ZrMe}_2$  is a preferred compound for use as a catalyst component (col. 5, line 20). In this case, the catalyst consists essentially of contact product and metallocene and chemically treated solid oxide wherein the chemically treated solid oxide comprises a solid

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oxide treated with an electron-withdrawing anion as well as organoaluminum. Clearly, organoaluminum is in contact with the solid oxide, and therefore, the solid oxide is treated not only with fluoride, but also with the organoaluminum.

9. Claim 30 is rejected under 35 U.S.C. 102(b) as being anticipated by Lin *et al.* (WO 02/16480; U.S. 7,098,277 relied upon for indexing).

Lin *et al.* discloses preparation of a catalyst comprising contacting fluorided silica with  $\text{Me}_2\text{Si}(2\text{-Me-4-PhInd})_2\text{ZrMe}_2$  and  $\text{B}(\text{C}_6\text{F}_5)_3$ ; see col. 20, lines 5-17. This catalyst is substantially free of organoaluminum compound.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (571)272-1104. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu S. Jagannathan, can be reached at (571)272-1119. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <<http://pair-direct.uspto.gov>>. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

/Rip A. Lee/  
Primary Examiner, Art Unit 1796

March 27, 2008